

ISS Facilities Hardware Catalogue for the Microgravity Science Glovebox

I. Facility

1. Facility Full Name: Microgravity Science Glovebox (MSG)
2. Sponsoring Agency: NASA
3. Co-Sponsors/Cooperation Agreements: ESA/NASA
4. Builder/Main Contractor: Daimler-Benz Aerospace
5. Project Manager: Barry Musick, NASA Point of Contact
6. Project Scientist: Charles Baugher

Microgravity Science Glovebox

II. Facility Characteristics

1. Facility Type: Facility Class Payload
2. Targeted Research Fields: Biotechnology, Combustion, Fluids Physics, Materials Science, Fundamental Science, Commercial Payloads
3. Accommodation: Launched in MPLM, Installed in US Module
4. Launch Date: UF-3
5. Status: at PDR
6. Facility Summary:

The MSG is a containment facility designed for supporting a wide range of microgravity science investigations and demonstrations. In the sealed mode, the MSG serves as a single level of containment by providing a physical barrier. In the air circulation mode the MSG serves as a one failure tolerant containment by providing a physical barrier and a negative pressure relative to the cabin.

The MSG further facilitates investigations by providing many of the resources that are typically used by microgravity science investigations. Some of the resources available are listed in the MSG characteristics below.

Microgravity Science Glovebox

III. Facility Performance Data

Work Volume: 260 liters, ~920 mm wide, ~650 mm high, ~500 mm deep (at the floor)

Maximum size of single piece of equipment in the Work Volume (WV) is:
406 mm diameter, 406 mm high (through side ports)
260x350x300 mm (through airlock)

Power available to investigation: +28V at useable 7 Amps
+12V at useable 2 Amps
-12V at useable 2 Amps (not independent of +12V)
+ 5V at useable 4 Amps
120V at useable 8.3 Amps
(Maximum total power draw from all outlets is
1000W)

Maximum heat dissipation: 1000W (800 from coldplate, 200 from air circ)

General illumination: 540 lux (higher illumination has been requested but
has not been agreed to by ESA)

Video: Color cameras, dedicated recorders

Data handling: RS422 between investigations in WV and PCS
Two MIL1553B connections between MSG and
PCS (one inside, one outside WV)
8 analog and 8 discrete signals in WV

Filtration: HEPA/charcoal/catalyst - replaceable on orbit

Other resources available: Nitrogen
Vacuum

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IV. Resource Requirements

Mass: 600 kg

Dimension: one ISPR

Power: 2.2 kw (when running a 1000 w investigation)

Data: RS422 between investigations in WV and PCS
Two MIL1553B connections between MSG and
PCS (one inside, one outside WV)
8 analog and 8 discrete signals in WV
2 Ethernet connections inside WV

Typical experiment duration: 6 hours

Consumables: filters, cleaning supplies, nitrogen

Ambient conditions: gravity level depends on location in ISS (no ARIS),
temperature is near ambient, 1000 w cooling,
humidity 25-70%

Crew time dependent on investigation - TBD

Stowage TBD